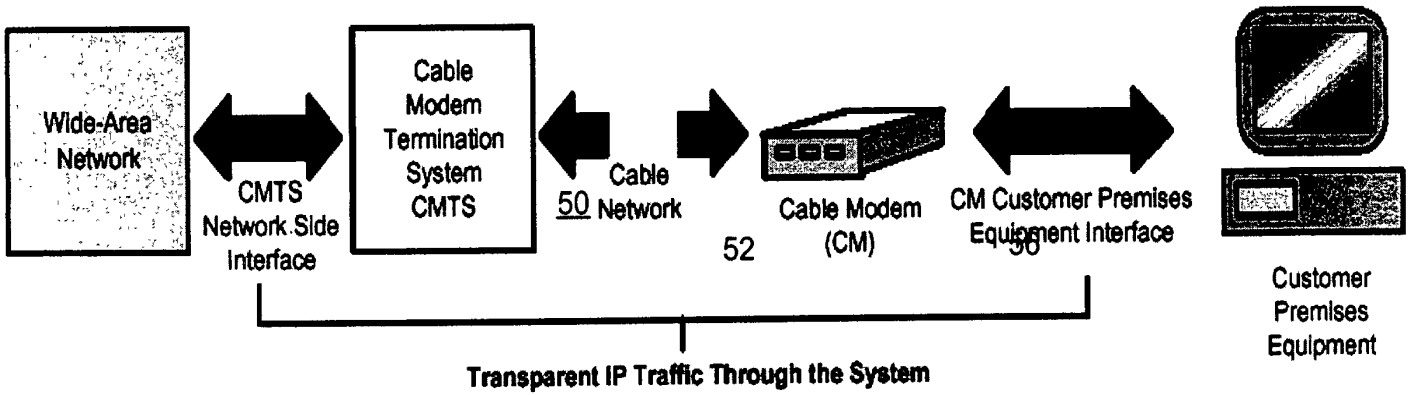
Wide-Area Network
CMTS Network Side Interface
Cable Modem Termination System CMTS
50
Cable Network
52
Cable Modem (CM)
CM Customer Premises Equipment Interface
56
Customer Premises Equipment
Transparent IP Traffic Through the System

FIGURE 1

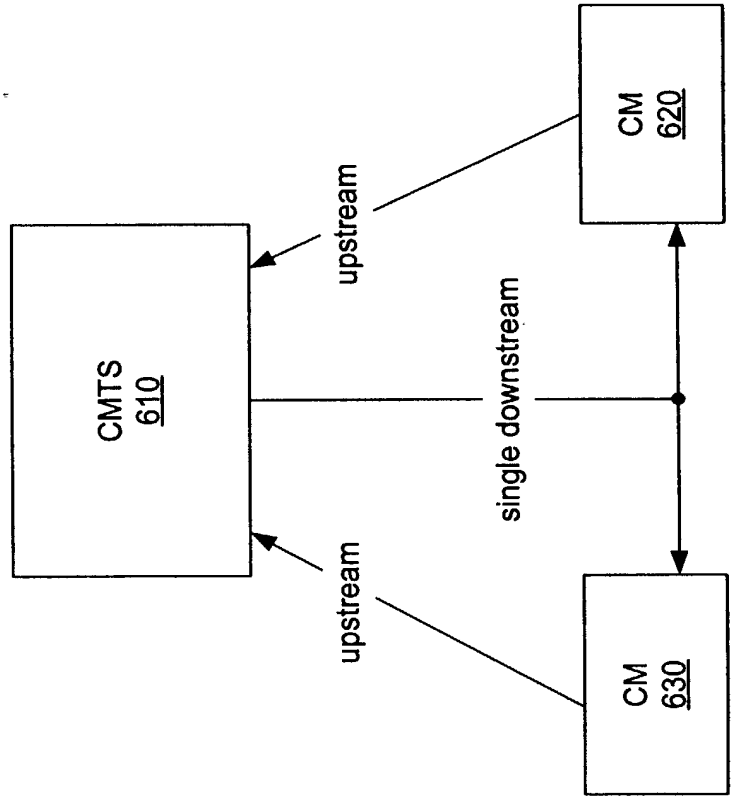

FIGURE 2

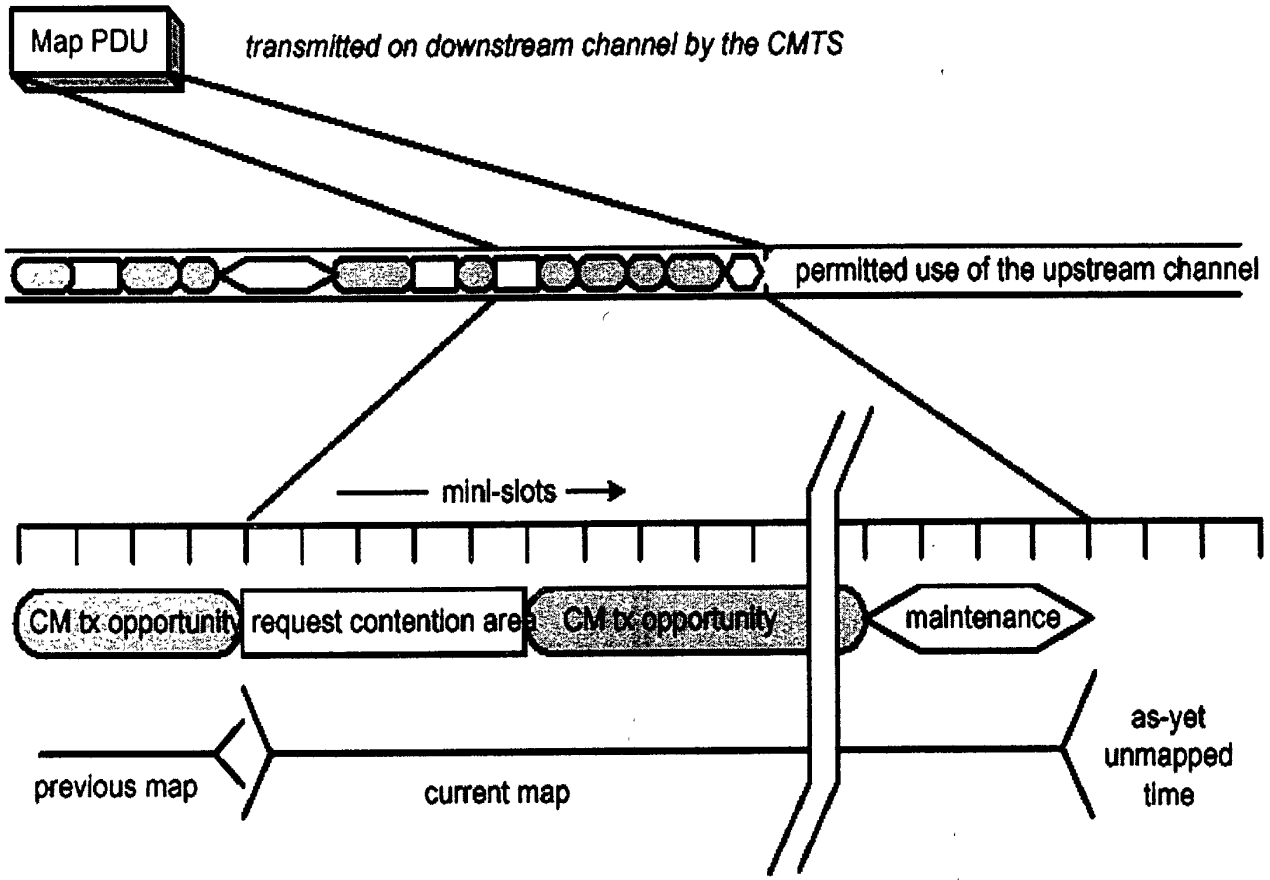
Map PDU
transmitted on downstream channel by the CMTS
permitted use of the upstream channel
mini-slots
CM tx opportunity
request contention area
CM tx opportunity
maintenance
previous map
current map
as-yet
unmapped
time

FIGURE 3

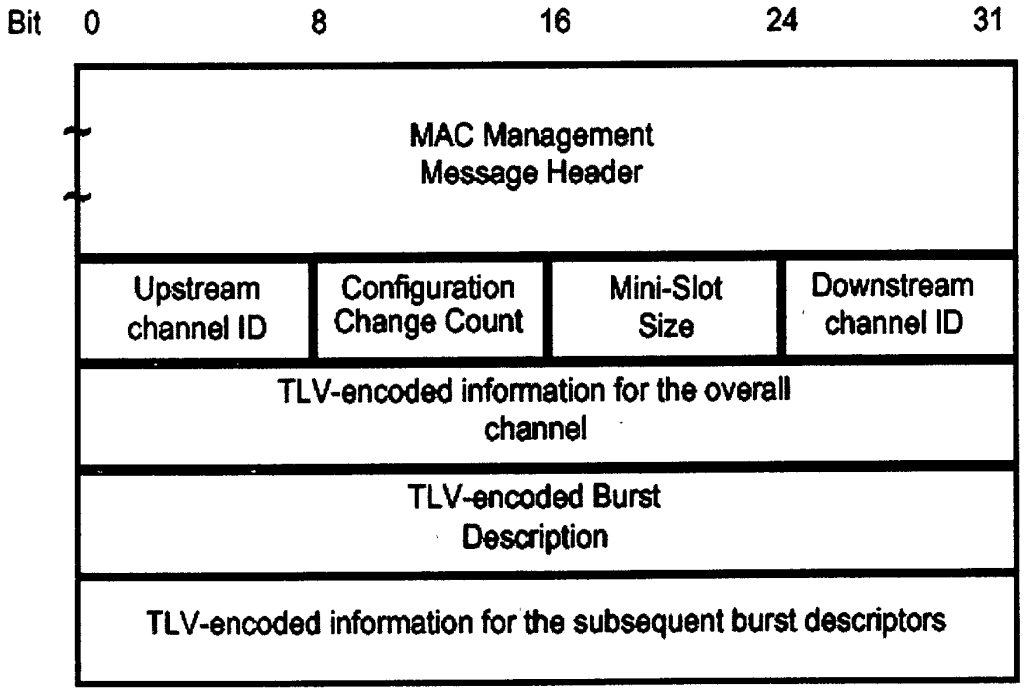
Bit
0
8
16
24
31
MAC Management Message Header
Upstream channel ID
Configuration Change Count
Mini-Slot Size
Downstream channel ID
TLV-encoded information for the overall channel
TLV-encoded Burst Description
TLV-encoded information for the subsequent burst descriptors

FIGURE 4

Type 1	Length 1	Symbol Rate
Type 2	Length 4	Frequency
Type 3	Length 1-128	Preamble Superstring
Type 4	Length N	First Burst Descriptor
Type 4	Length N	Second Burst Descriptor
Type 4	Length N	Third Burst Descriptor
Type 4	Length N	Fourth Burst Descriptor

FIGURE 5

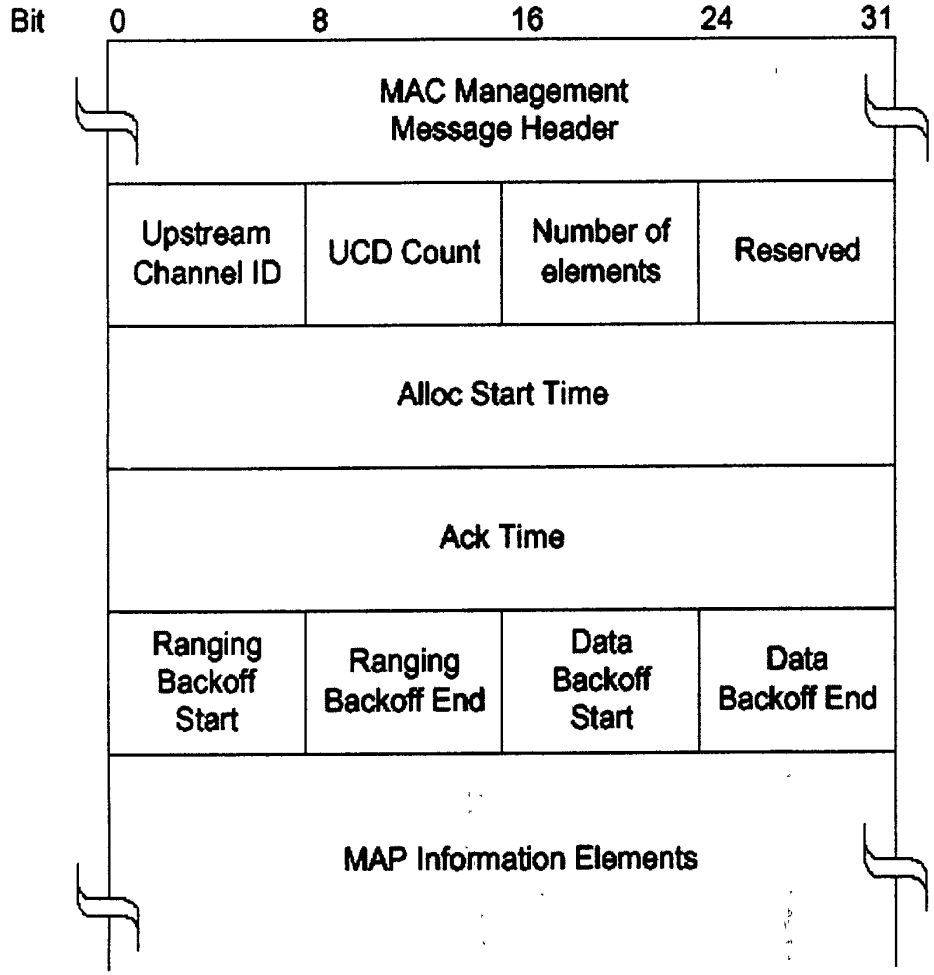
Bit
0
8
16
24
31
MAC Management Message Header
Upstream Channel ID
UCD Count
Number of elements
Reserved
Alloc Start Time
Ack Time
Ranging Backoff Start
Ranging Backoff End
Data Backoff Start
Data Backoff End
MAP Information Elements

FIGURE 6

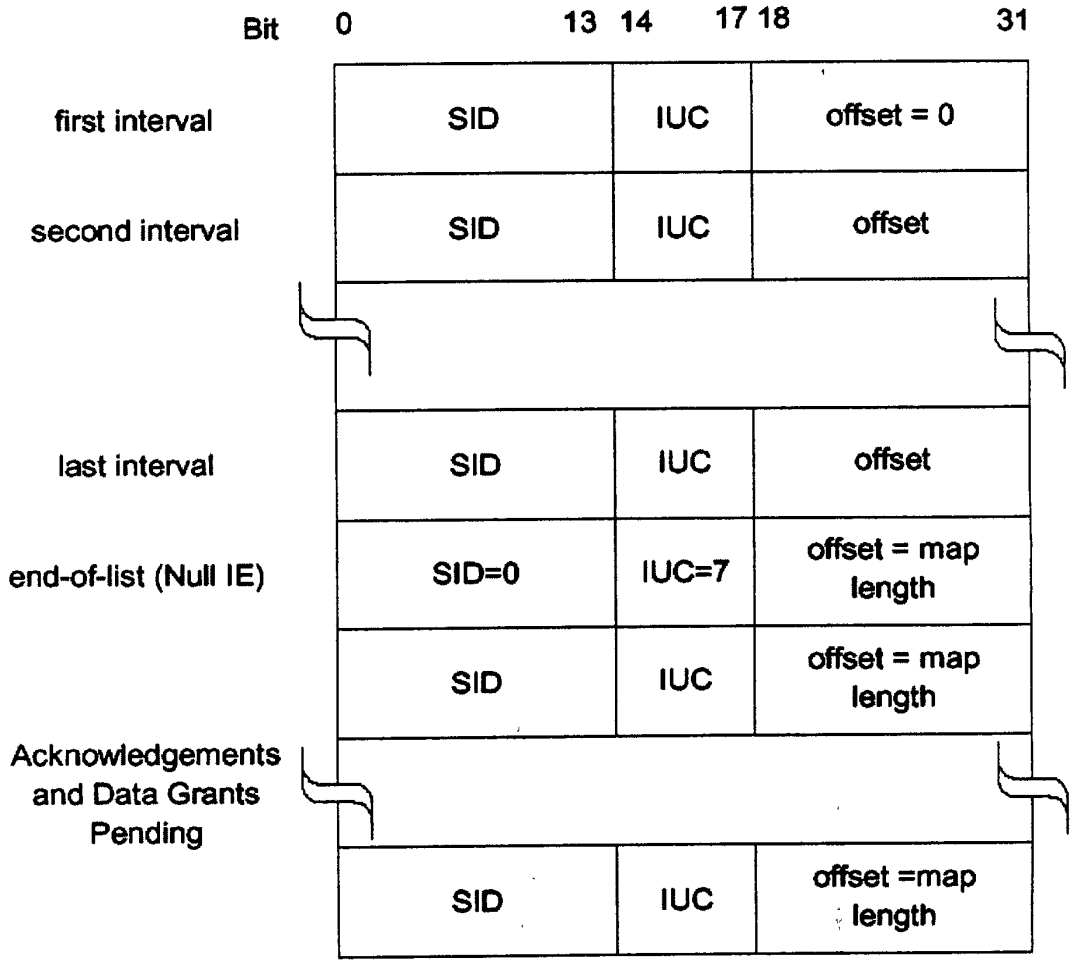
Bit
0
13
14
17
18
31
first interval
SID
IUC
offset = 0
second interval
SID
IUC
offset
last interval
SID
IUC
offset
end-of-list (Null IE)
SID=0
IUC=7
offset = map length
SID
IUC
offset = map length
Acknowledgements and Data Grants Pending
SID
IUC
offset =map length

FIGURE 7

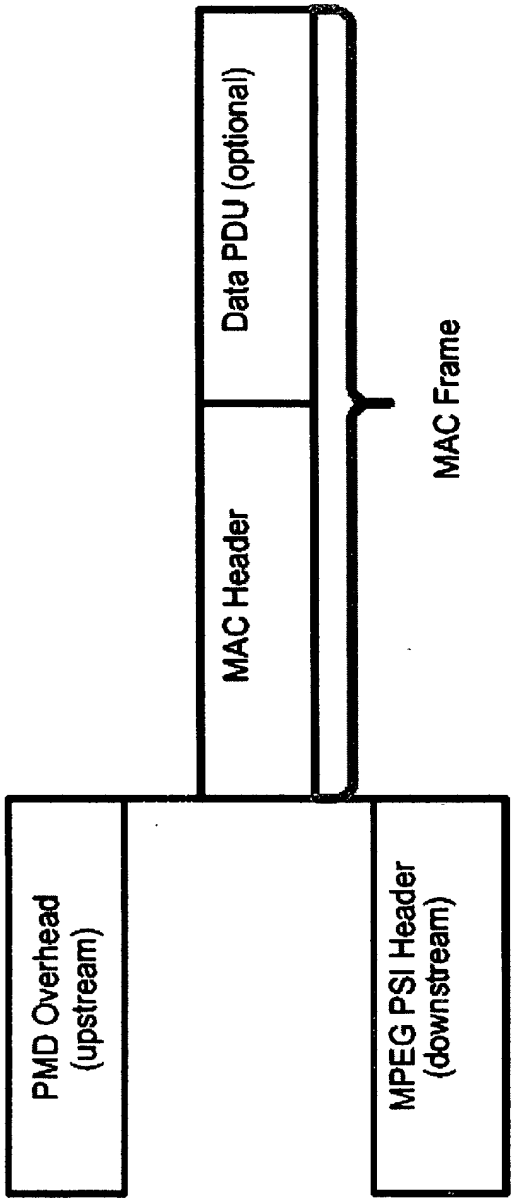
PMD Overhead
(upstream)
MAC Header
Data PDU (optional)
MAC Frame
MPEG PSI Header
(downstream)

FIGURE 8

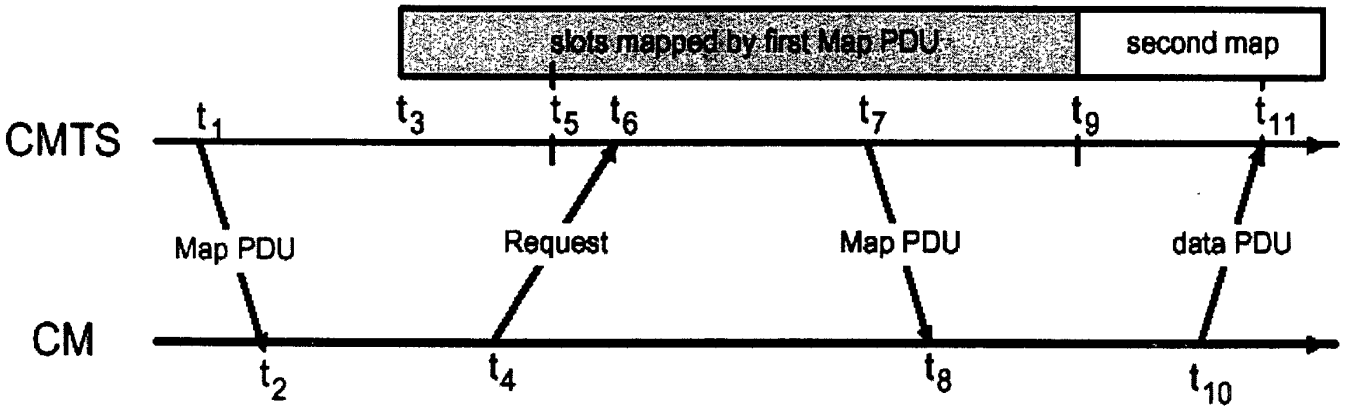
slots mapped by first Map PDU
second map
CMTS
CM
t1
t2
t3
t4
t5
t6
t7
t8
t9
t10
t11
Map PDU
Request
Map PDU
data PDU

FIGURE 9

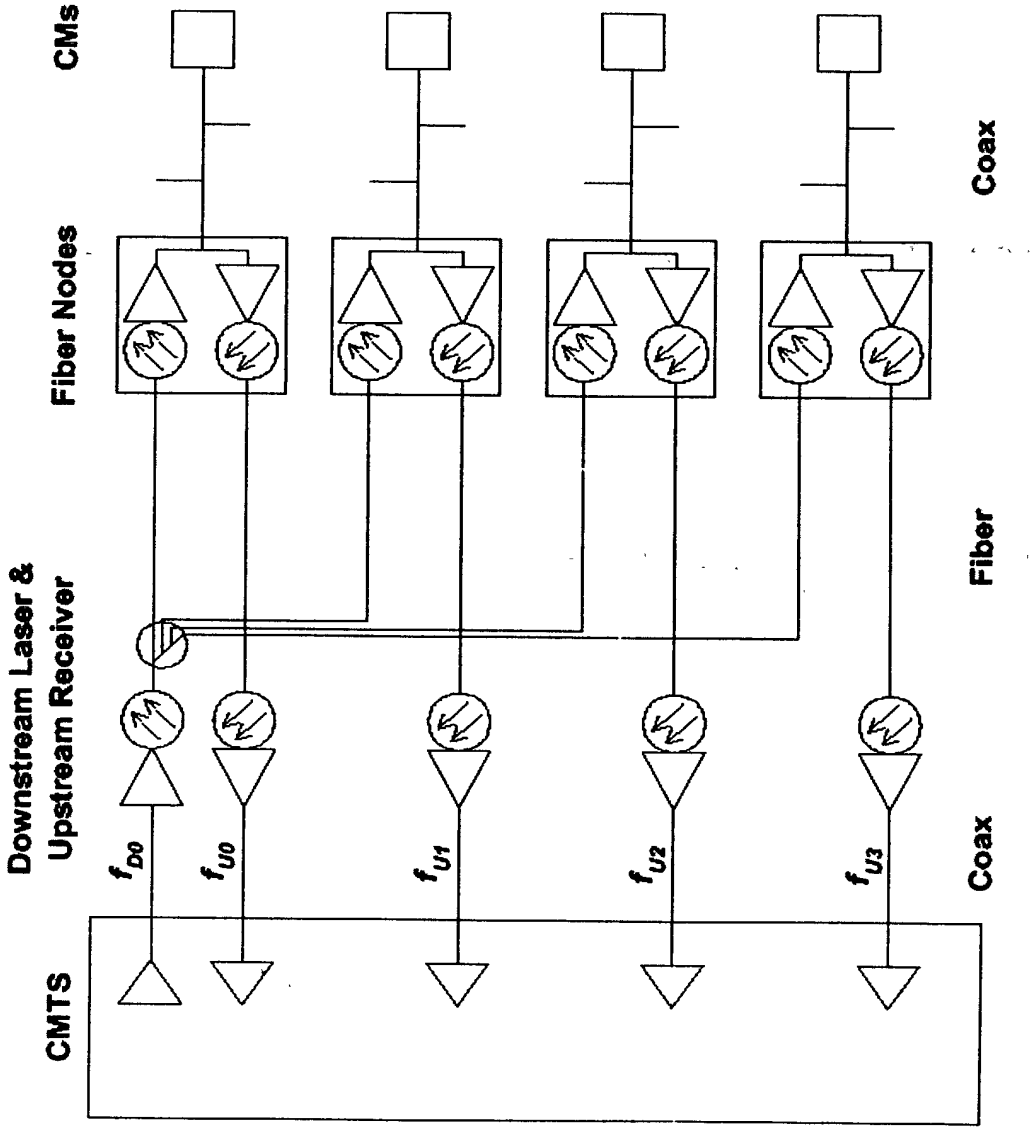
CMTS
Downstream Laser &
Upstream Receiver
Fiber Nodes
CMs
Coax
Fiber
Coax
f_{D0}
f_{U0}
f_{U1}
f_{U2}
f_{U3}

FIGURE 10

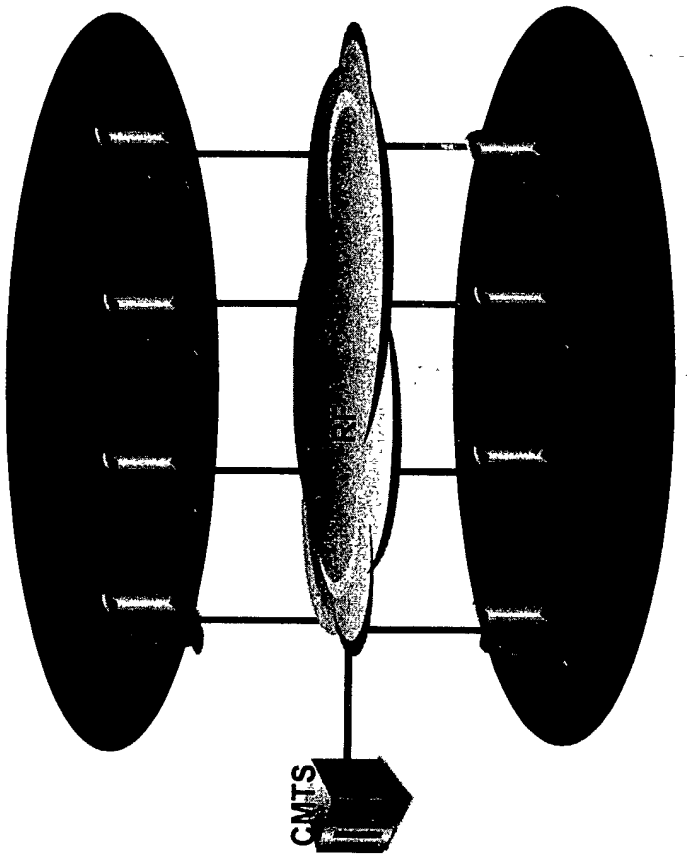

FIGURE 11

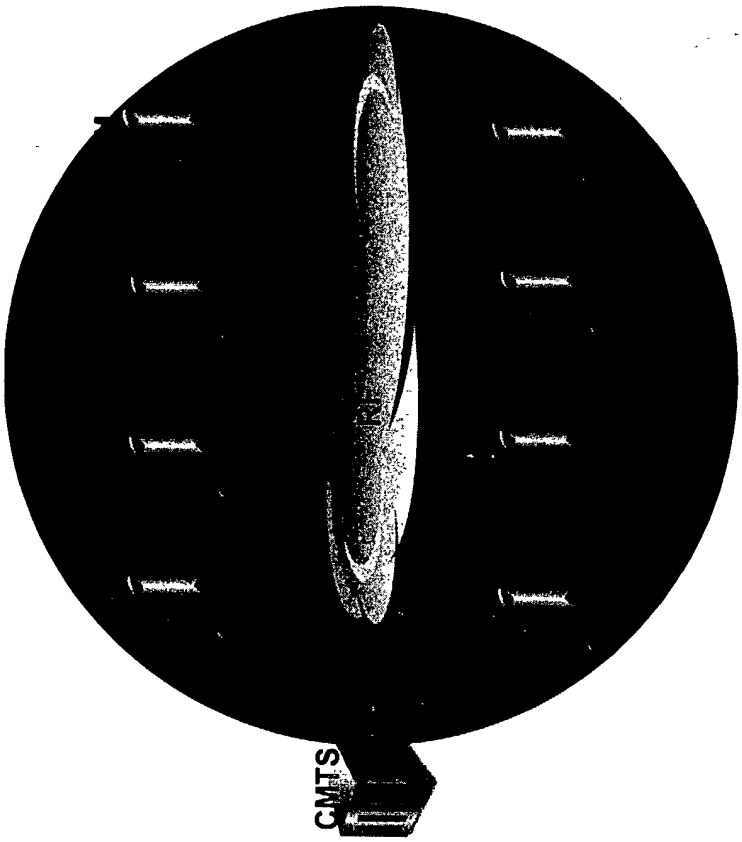

FIGURE 12

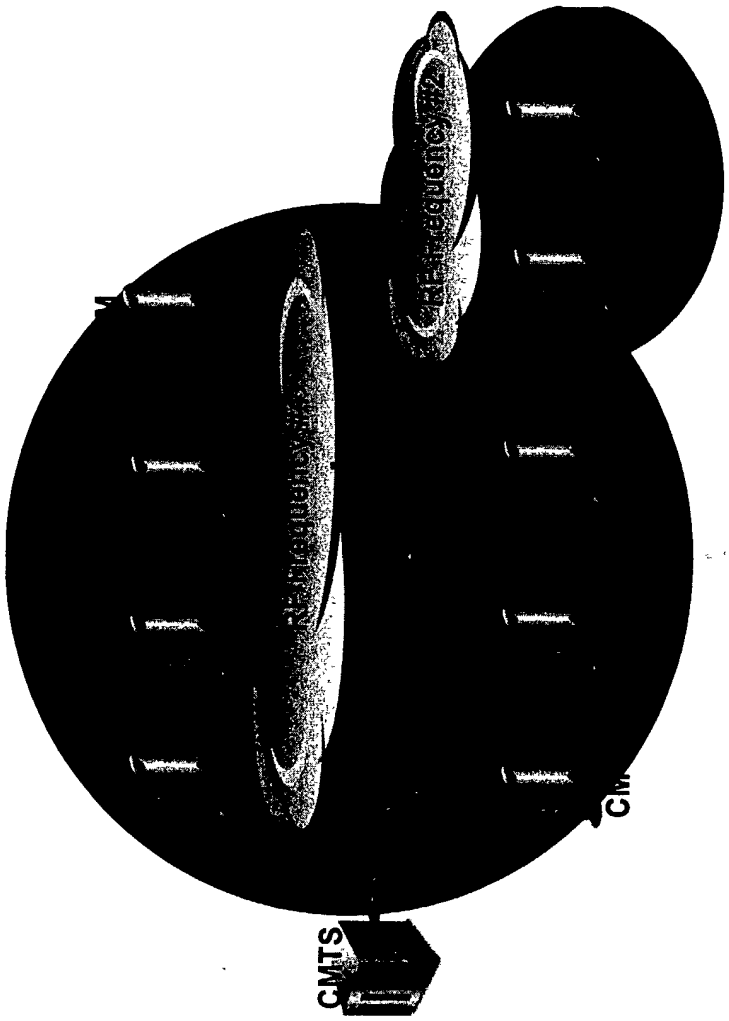

FIGURE 13

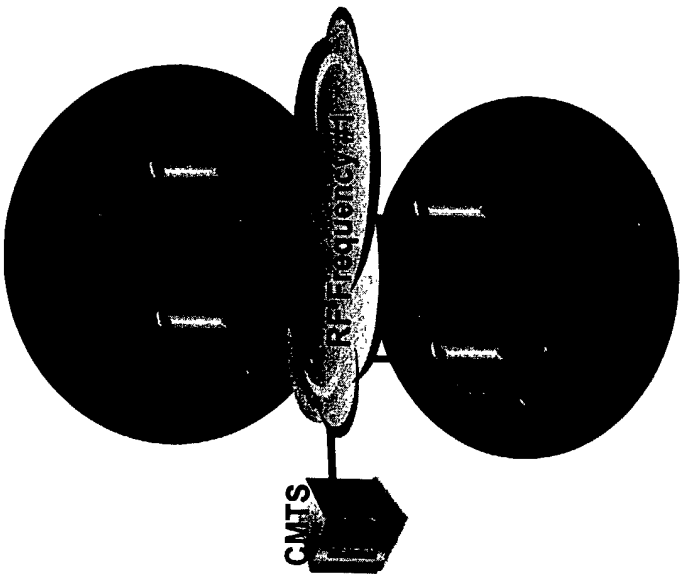

FIGURE 14

Total Area
Request Contention Area for Virtual Upstream 1
Data Transmission area for CM A (SID1)
Data Transmission Area for CM B (SID2)
Initial maintenance Area for Virtual Interface 1
Request Contention Area for Virtual Upstream 2
Data Transmission Area CM C (SID3)
Data Transmission Area for CM D (SID4)
Initial maintenance Area for Virtual Interface 1
t1
t2
t3
t4
t5
t6
t7
t8
t9

FIGURE 15

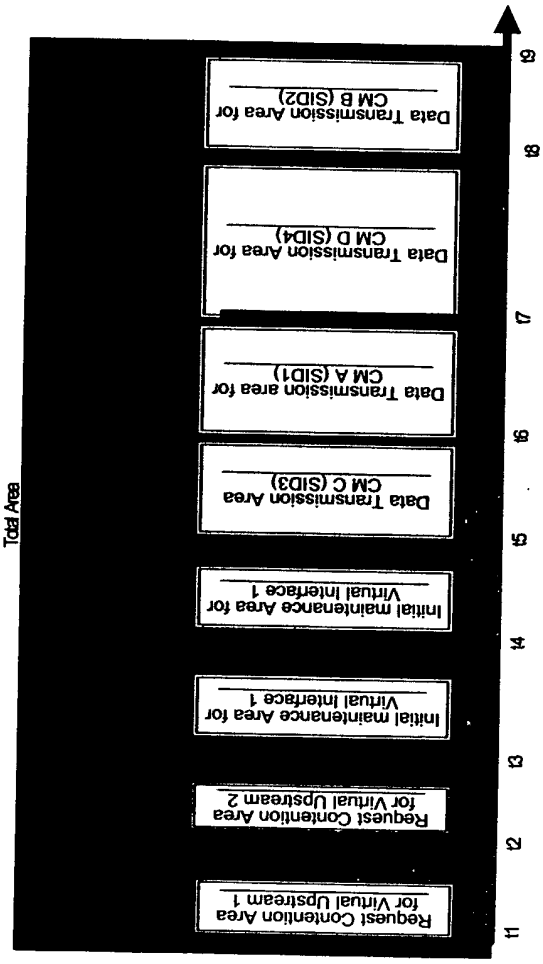
Total Area
Request Contention Area for Virtual Upstream 1
Request Contention Area for Virtual Upstream 2
Initial maintenance Area for Virtual Interface 1
Initial maintenance Area for Virtual Interface 1
Data Transmission Area CM C (SID3)
Data Transmission area for CM A (SID1)
Data Transmission Area for CM D (SID4)
Data Transmission Area for CM B (SID2)
t1
t2
t3
t4
t5
t6
t7
t8
t9

FIGURE 16

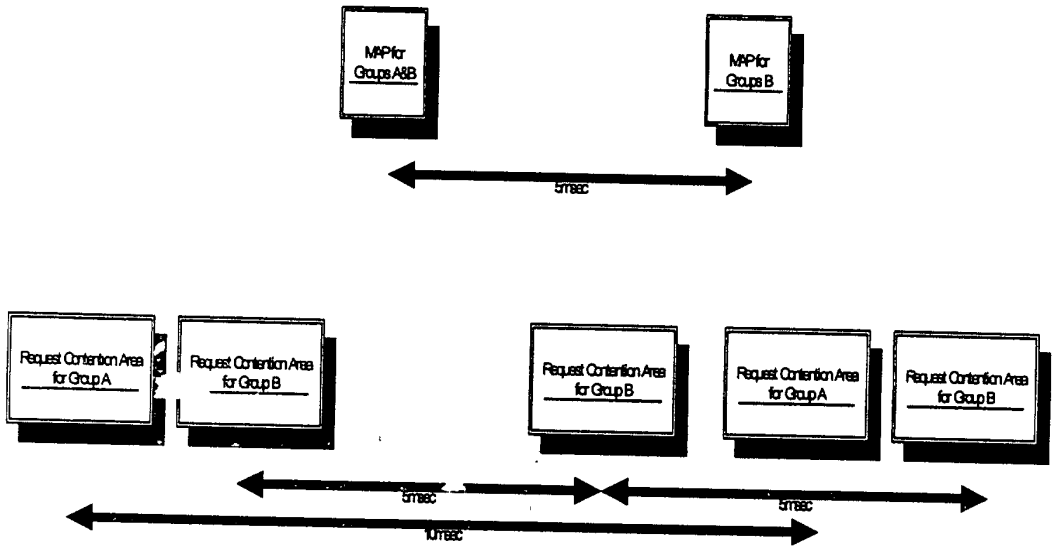
MAP for Groups A&B
MAP for Groups B
5msec
Request Contention Area for Group A
Request Contention Area for Group B
Request Contention Area for Group B
Request Contention Area for Group A
Request Contention Area for Group B
5msec
5msec
10msec

FIGURE 17

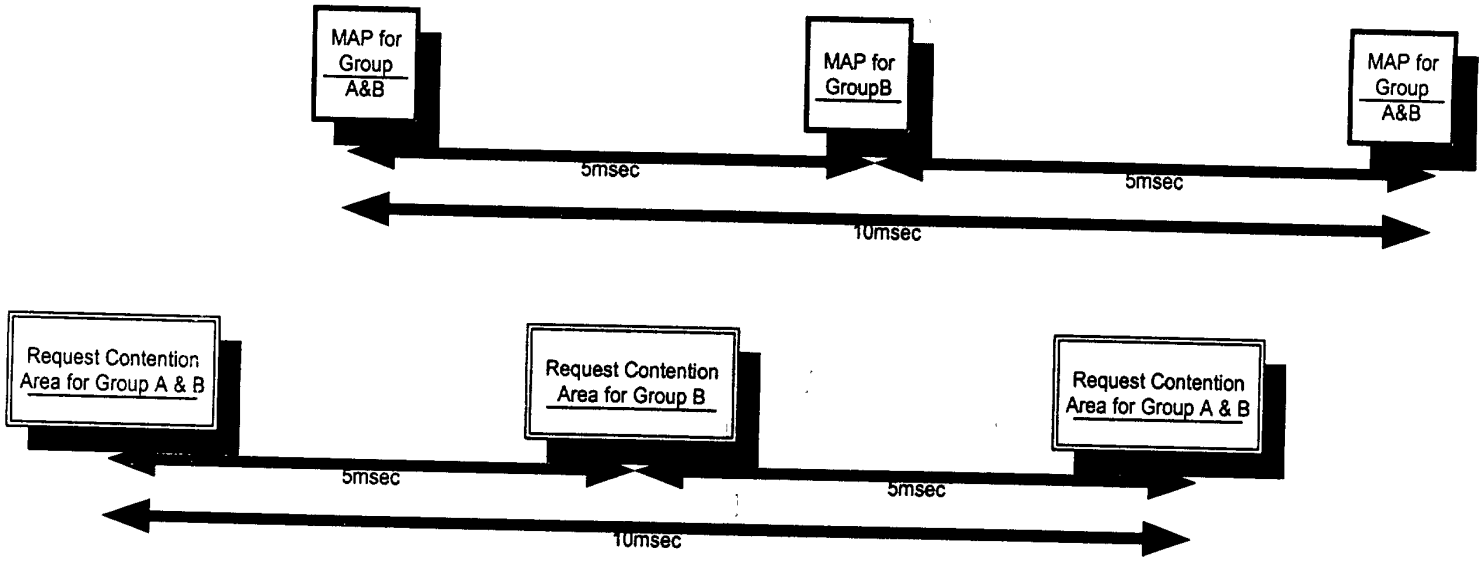
MAP for Group A&B
MAP for GroupB
MAP for Group A&B
5msec
5msec
10msec
Request Contention Area for Group A & B
Request Contention Area for Group B
Request Contention Area for Group A & B
5msec
5msec
10msec

FIGURE 18